

The Large Tortoiseshell Butterfly: a Further Note

By P. B. M. ALLAN

It was with not a little pleasure that I read Mr H. G. Short's interesting paper on *Vanessa polychloros* L. in last December's *Record* (vol. 79, No. 12, pp. 306-7); his valuable observations concerning the pairing of this fine butterfly in captivity are welcome indeed. I have always felt that Boisduval and his confrères Rambur, Graslin and Guenée must have been satisfied that some proof of a spring pairing of *polychloros* had been obtained and recorded; but unhappily being immobilised these last few years I have been unable to visit libraries in order to search the Continental literature, both the periodicals and the proceedings of various societies.

What I want to know now is the evidence upon which Boisduval based his assertion that *polychloros* pairs in the spring and whether that assertion was based on a pairing—or better still several pairings—observed out-of-doors or only in conditions similar to those recounted by Mr. Short. Also whether the subsequent assertions of Rambur, Graslin and Guenée were based on their individual personal observations or only on Boisduval's evidence. Unhappily during a long life I have met with so many erroneous assertions made from mistaken interpretations of insect behaviour or even by slips of the pen, which have been copied by many subsequent writers, that I have become a little sceptical about some recorded assertions of insect bionomics.

Happily Mr. Short's evidence of the pairing of *polychloros* is irrefutable so far as concerns the pairing habit of this species in captivity in England. No confirmation is required; if it were, doubtless his careful observations would be confirmed by every lepidopterist who bred this butterfly in similar conditions in the South of England. But for my part I feel that I still want to know what the pairing habit of this species is in England out-of-doors, where it has to undergo four winter months when frost and the heavy damp of fogs prevail. For the occurrence of quite a number of our Lepidoptera is governed by the mean temperature between October and March. Possible examples of this are, among the butterflies, *Melitaea cinxia* L. the Glanville Fritillary,* *Thymelicus acteon* Rott. the Lulworth Skipper, *Lysandra bellargus* Rott, the Clifden or Adonis Blue, and among the moths, *Zygaena meliloti* Esp. The New Forest Burnet, *Leucochlaena hispida* Geyer the Beautiful Gothic, and a number of others which are to be found only south of a line drawn from Bristol to London. There is a number of species too which, formerly common north of the Thames, have withdrawn to the south of it during the last hundred and fifty years.

All these species can flourish continuously in our island only when the mean winter temperature is never below 42°F. (Dr. T. A. Chapman pointed this out in this magazine many years ago). Their range will not extend normally to those parts of England where the mean winter temperature is only 40°F. If the mean temperature throughout the winter in Mr. Short's greenhouse was not more than 2-3°F. higher than it was out of doors this may have to be taken into account. Lepidoptera are (to us,

*Mr. Short, writes me *in litt.* "I am not convinced that *cinxia* for instance is controlled by the winter temperature. The young larvae need a lot of sun, and the controlling factor could well be the amount of sun in late summer."

extraordinarily) sensitive to atmospheric conditions, as indeed every moth-hunter who goes sugaring knows. Aridity and humidity, radiant heat stored up by the earth, and particularly by rocks, not to mention shelter from persistent east winds (causing aridity during a particular phase of metamorphosis) a daily maximum of sunshine or a prolonged canopy of cloud, or some weeks of snow and a long succession of frosts during a severe winter—all these things may count in the life-history of a lepidopteron.

An obvious difficulty facing us in this matter of mean winter temperature in the case of the Large Tortoiseshell butterfly is of course that *poly-chloros* is known to have occurred in places a good deal further north than Mr. Short's Surrey greenhouse. Yet it may be significant that during at least the last forty years this butterfly has been on the decline in all parts of our island north of Lat. 52°N. except in the extreme east. Ford in his *Butterflies* (1928, p. 128) writes that "it is now well established only in the eastern part of Suffolk and north Essex." Certainly it used to occur, and not uncommonly, a good deal farther north than it does to-day. Newman (1871) recorded it north of the Thames from Cheshire, Cumberland, Derbyshire, Durham, Lancashire, Northants, Nottinghamshire, Shropshire, Warwickshire, Worcestershire, and Yorkshire. Barrett (1893) mentioned North Wales, Leicestershire, Northumberland, and, significantly, the Tweed and Clyde districts, Aberdeenshire and Argyll. The farthest north it attains to-day (1968) to my personal knowledge is Herefordshire; if other lepidopterists have taken or seen it recently in a county north of that shire I hope they will send their reports to our Editor.

But here there are so many imponderables that in the present state of our knowledge it is useless to speculate about the cause or causes of this decline. What with the felling of great areas of woodland, e.g., as at Yardley Chase (total destruction), the Forest of Dean, Wychwood, Rockingham, Sherwood and a dozen other of the former forests of England, with the clearance of millions of acres which were cultivated less than a half-century ago, the felling of elms and oaks in hedgerows; in other words the enormous encroachments on the fertile countryside caused by the spread of mankind in an already densely populated island, a density that is increasing yearly at an ever-accelerating rate, area climates and microclimates* are constantly being changed; climatic changes which albeit imperceptible by man may be, and in many cases are, fatal to Lepidoptera.

Yet apart from the imponderables one can say with some assurance that so far as Western Europe is concerned *climate* is the over-riding factor, over-riding many other factors, which determines the occurrence of a particular lepidopteron in a particular place. Thus it is climate which decides the latitudes and longitudes between which a lepidopteron can find conditions congruous with all its physiological requirements. If one of

*I use the terms 'microclimate' and 'areacclimate' *sensu lato*, since although the literature of the subject is now extensive, observations made to-day are seldom of value in the case of the British butterflies owing to the lack of means of comparison with the condition prevailing fifty years ago. Uvarov's *Insects and Climate* appeared in 1931 (*Trans. Ent. Soc. Lond.*, **79**: 1-247) and Cloudesley-Thompson's *Microclimates and the Distribution of Terrestrial Arthropods* in 1962 (*Ann. Rev. Ent.*, **7**: 199-222), both valuable to lepidopterists. There is a short bibliography in *The Concept of Microclimate from an Entomological Point of View* by C. C. Coulianos in *Opuscula Entomologica*, 1968 (vol. 33, Parts 1-2, pp. 51-57).

those requirements cannot be supplied in a particular environment the insect must go elsewhere—or become extinct in that place. The following species became extinct in this island between 1800 and 1900, all of them before the 'imponderables' mentioned in the previous paragraph would have had to be considered. With the exception of the Large Copper (which may have been exterminated in the neighbourhood of Whittlesea Mere by collectors but is known to have occurred in other localities where I have found no evidence of collecting) there are records of only a few sporadic captures—as we should expect—after the year 1900.

Cyaniris semiargus Rott. (Mazarine Blue), *Lycaena dispar* Haw. (Large Copper), *Lycaena virgaureae* L. (Middle Copper), *Aporia crataegi* L. (Black-veined White), *Laelia caenosa** Hb. (Reed Tussock), *Lymantria dispar* L. (Gipsy Moth), *Simyra albovenosa* Göze (Reed Dagger), *Apamea pabulatricula* Brahm (Union Rustic), *Apatele strigosa* Schf. (Marsh Dagger), *Trachea atriplicis* L. (Orache), *Epicnaptera ilicifolia* L. (Small Lappet), *Hadena dysodea* Schf. (Small Ranunculus), *Leucodonta bicoloria* Schf. (White Prominent), *Coscinia striata* L. (Feathered Footman), *Euphyia polygrammata* Bork. (Many-lined).

Why did these species of the larger British Lepidoptera become extinct in England between 1800 and 1900 while they were, and are, still common, or at least frequent, in the countries fronting our island? The answer to that question can only be that one or two conditions were operating in the case of each of them: the climatic change, though imperceptible to us humans, had been too fast for their powers of adaptation to cope with or that each of these species had reached the limit of its powers of adaptation. And are not many more species, at present in our country, on the way out? Ask any experienced elderly lepidopterist how many species of the larger moths which were accounted common fifty years ago are rare to-day. I dare say such a man could give you a list of twenty and more.

It may be that the Large Tortoiseshell is one of these species which for some years have been "on the way out" of our island. I can think of only two butterflies which, having become extinct in many places in England, suddenly made a 'come-back'. I say 'suddenly' because their appearances occurred in places which for years had been regularly 'worked' by lepidopterists. These two species were *Limenitis camilla* L., the White Admiral, and *Polygonia c-album* L., the Comma. In 1934, when for some years the plenitude of these two species in the south of England had been declining, both these butterflies appeared north of the Thames, and not uncommonly, in places whence neither had been recorded previously. In 1936 I watched several of both species flying in a West Hertfordshire woodland which I had visited several times every year since 1920. Next year they were reported from Essex, and by 1938 both had reached almost to the coast of that county, where they were seen in some numbers.

I regard these two species as exceptions in the experience of most lepidopterists. For at least a century the Large Tortoiseshell is known to have occurred, and quite commonly, in the neighbourhood of Manningtree, in the valley of the river Stour in Essex. In 1966 Mr Derek Ashwell told me that he could no longer find the insect there where he had found it for several years previously. Yet in view of the constantly increasing 'im-

**Sic* Barrett (*Lep. Br. Is.*, 1895, Vol. 2, p. 313) and most of the modern books. Kloet and Hincks (*Check List*, 1945) spell it (probably correctly) *coenosa*.

ponderables' above mentioned it seems unlikely that *polychloros* will make a 'come-back' in this country within the lives of many lepidopterists living to-day. It *may* happen; but at present, in view of its known and recorded declension from so many and so widely dispersed localities, it seems doubtful.*

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It must be rare for a lepidopterist to find two *polychloros* in cop. out of doors. Mr. Short tells us that in his greenhouse "they begin to move on the first sunny day when the temperature reaches 50°F., usually in March" (that is to say 50° in the greenhouse) and that "pairing occurs quite soon after the insects move in the spring." How many collectors throughout England between Trent and Channel make a practice, annually, of prowling daily for two or three hours between mid-March and mid-April on the outskirts of a wood where *polychloros* has been caught previously? Fifty? A hundred? I doubt if there are ten who do. It seems to me that the odds against any lepidopterist repeating Mr. Wykes' experience (*Entomologist*, 81 (1948), No. 1017, p. 42) must be some hundreds to one.

On 17th April Mr. Wykes perambulated a Suffolk wood where there were a good many *polychloros* which in his opinion had hibernated in that wood. "In the wood," he wrote, "they seemed to settle mostly on the tree-trunks"; but he does not appear to have noticed a pair in cop. Which is not surprising in view of the colouration of the undersides of these insects' wings.

Mr. Short makes the (significant to me) remark that "one must be patient to get eggs from a wild ♀ captured in the spring. It may be necessary to keep it for 3-4 weeks." Why is this? Moreover, the female which Mr. Wykes netted on 17th April had its body "much distended with eggs", yet it was not until a fortnight later that "some warmer weather brought it into activity" and it laid a batch of 150 eggs. In most of the instances in which I have reared British butterflies, eggs were laid the day after, or at most the second day after, pairing. The exceptions were the common English Vanessids, which like Mr. Short's and Mr. Wykes' specimens, delayed oviposition for a time.—But my experience of breeding butterflies is negligible: I do not think I have reared more than twelve or fourteen, and only once with each species.

Probably it has been the experience of most breeders of British Lepidoptera that when these insects are reared in optimum conditions they do not always behave as they do in conditions which vary from bad to 'not so bad'. The fact that the Large Tortoiseshell has been found, in England, on several occasions to pair in the autumn in the wild suggests that, like

*Mr. Short writes: "I fully accept your argument that the decline of *polychloros* probably had a climatic cause; but nevertheless there was something odd about its disappearance from the Stour valley For 5-6 years in succession I used to make expeditions with Mr. A. D. Blaxill of Colchester to see this species in this area. From 1951-3 it was quite common in several woods in the area and one could see a number of specimens on a warm day in late April or early May. Several times we captured ♀♀ and obtained eggs, and on each occasion I released there a number of the resulting offspring. In the spring of 1954, however, all we saw were two specimens; both were caught and found to be ♂♂. In 1955 not one was seen, nor have I been able to find first hand evidence that one has been seen there since. The point I am making is that its decline (in this area at least) was very rapid."

most animals, it has a fairly wide power of adaptation. Mr. Short writes (*in lit.*) "Incidentally, the ♂♂ are more difficult to bring through the winter than ♀♀." This again seems to me to point—so far as England is concerned—to the gradual resumption of an ancestral habit, the males formerly dying after they had fertilised the females in the autumn. In the south of France and in Italy *polychloros* is double-brooded (? the beginning of an evolutionary development or is it merely the continuation of an ancestral habit?). It would be interesting to know the mean winter temperature in the most northerly place where it is regularly double-brooded.

An interesting note by Miss Vere Temple appeared in *Entomologist* in 1943 (vol. 76, p. 30). She had been watching *polychloros* on the wing in the Stour valley "during the spring and late summer both of 1941 and 1942 . . . The butterflies appeared first in April . . . in company with Small Tortoiseshells. *Polychloros* and *urticae* played together, turning aerial somersaults and flying to and fro in figure-of-eight patterns. A male *polychloros* was apparently trying to copulate with a female *urticae*, creeping over her and fanning his wings in quick motion. She awaited him with the tip of her body upturned.* The male then left her and did not return, so that I did not see the upshot of this strange courtship."

This observation, taken together with the actual pairing of these two species recorded by G. H. Raynor (*Ent. Rec.*, 79: 187) and the experience of J. A. Towell (*ibid.*) suggests that the ♂ *polychloros* is, at least sometimes, not averse from pairing with a ♀ *urticae* and that certain *urticae* ♀♀ are not averse from such a proceeding.

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Mr. G. B. Prior has kindly sent me an interesting note about another English tortoiseshell butterfly, the Comma (*Polygonia c-album* L.), relating an experience which he had with a hibernating female (or females) of this species. In September 1934 he received three live males and two females of this species from Hampshire. The males were set as specimens; the females he thought had "most probably paired", so he put them in a cage and fed them on sugar and honey placed upon various garden flowers. They continued feeding until early October, when he placed them in a breeding cage and covered them with a cloth, where they settled down for the winter. "Early the following April", he continues, "I uncovered the cage and found them both dormant. Being a nice sunny morning I placed them indoors and fed them again with some sugar and honey on flowers as before. The next day they appeared quite active, and I gathered some young stinging-nettle sprays and placed them with the flowers. On the fourth day after they had awakened from hibernation I was delighted to see several eggs upon the nettle leaves, eventually getting quite a number. These eggs hatched, and I have in my cabinet some nine pairs of var. *hutchinsoni* selected from the broods. The butterflies emerged between the 1st and 21st July 1935".

With regard to my remark (*Ent. Rec.*, 79: 155) about female butterflies pairing while their wings were still limp and even unexpanded, Mr. Prior writes: "Mr. Allan in his collecting days must have seen the males of *L.*

*Mr. Short writes *in litt.* "In my experience, when a ♀ ostentatiously turns up her body on the approach of a ♂ this is a sign that she had paired already and will have none of him, and the ♂ usually takes the hint".

coridon (Chalkhill Blue) searching for the females, and have seen many times males in cop, with the females with quite limp and unexpanded wings, which would point to copulation on emergence being general with *coridon*."

Holiday at Thorpeness, Suffolk, 1968

By S. WAKELY

Once again my wife and I decided to have a fortnight's holiday at Thorpeness. This made the fourth holiday at the same bungalow since our first visit in 1964, but this time we chose July (13th to 27th).

Mr Raymond Uffen accompanied us and we were met at Saxmundham Station by Mr. H. E. Chipperfield who took us in his car to Thorpeness. He also brought along my Robinson moth trap which had been left at his house at Walberswick a few weeks previously by Capt. John Ellerton in readiness for our holiday. Both Capt. Ellerton and Col. A. M. Emmet joined us at the end of the first week.

About 60 different species (including micros) were in the trap the morning following our arrival, and their number fluctuated between this and 80 practically every night during our stay. The species that amazed us for the numbers in which it appeared was *Synaphe punctalis* F. One night we estimated there were over 300 in the trap—all males. In spite of a casual look around the beach after dark I never saw a female during our stay.

Every morning the trap was taken into the garage and a log of the species present was kept. Those we wanted were boxed and the others released. Some of the moths flew to the garage window and were examined but others possibly escaped before they could be checked.

The best macro taken was undoubtedly the *Celama trituberculana* Bosc which was found at rest on the window frame of the garage on the 14th. As this was at the commencement of our holiday we quite expected others to be taken later, but no more were seen. In 1964 we took five specimens of this rarity here. (*Ent. Rec.* 76: 274).

Over 270 different species of lepidoptera were taken at our M.V. lights during the fortnight. For the second week we had the added benefit of Capt. Ellerton's light which was worked the land side of the bungalow as well as my light overlooking the sea in a porch or verandah.

The most noteworthy species at light were as follows: *Hyloicus pinastri* L. (one), *Agrotis clavis* Hufn. (one), *Euschesis interjecta* Hubn. (several in good condition), *Heliothis peltigera* Schiff. (one on 23rd), *Polia nitens* Haw. (one on 16th), *Hadena compta* Schiff. (one), *Helio-phobus albicolon* Hubn. (one on 18th), *Leucania straminea* Treits., *L. litoralis* Curt., *Arenostola elymi* Treits. (a few only), *Apamea oblonga* Haw. (one on 21st), *Cucullia asteris* Schiff., *Earias clorana* L., *Schrankia costaestrigalis* Steph., *Zanclognatha cribrumalis* Hubn., *Geometra papilionaria* L., *Sterrhia ochrata* Scop. (common), *Euphyia unangulata* Haw., *Cidaria fulvata* Forst., *Chesias rufata* F. (several), *Witlesia pallida* Steph., *Evergestis extimalis* Scop. (one on 16th), *Aglossa pinguinalis* L. (one), *Anerastia lotella* Hubn. (a few only), *Dioryctria abietella* Schiff. (one), *Epischnia boisduvaliella* Guen. (a few only), *Nyctegretis achatin-*